HK-7X 2.4GHz 7CHANNEL

SPREAD SPECTRUM TECHOLOGY

USER MANUAL

Content

Before using this product, check that you have all of the following items. If any items are missing, please contact dealer.

Name	Amount	Picture
Transmitter	1	
Receiver	1	
Manual	1	

Introduction

Thank you for purchasing HobbyKing.com® HK-7X digital proportional R/C system. This system is extremely versatile and may be used by beginners and professionals alike. In order for you to make the best use of your system and to fly safely, please read this manual carefully. If you have any difficulties while using your system, please contact cs@hobbyking.com

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Precaution of Safety

- It requires professional skills and technical knowledge to install and operate R/C model properly. Incorrect installation and operation will result in severe property loss and personal injuries.
- HK-7X 2.4GHz control system is exclusively designed for civil use of R/C models. Don't use it in any other flying machines.
- The governmence for R/C model is different in different place, therefore, please consult your local regulatory body and follow the rules and regulations to operate legally.
- Radio wave transfers almost in straight routine in 2.4GHz, please make sure there is no any obstacle when you are operating the product. The antenna tube should point at the controlled model to ensure efficient control, and keep conductive materials away from receiver and transmitter.
- If there is prang, collision, welter and other accidents when operating, please test all the things before next operating.
- Always keep electrical components away from small children.
- Stop flying long before your batteries become low on charge. Do not rely on your radio's low battery warning. systems, intended only as a precaution, to tell you when to recharge. Always check your transmitter and receiver batteries prior to each flight.
- Before flying, be sure that the frequency you intend to fly with is not in use, and secure any frequency control device (pin, tag, etc.) for that frequency before turning on your transmitter. It is never possible to fly two or more models on the same frequency at the same time. Even though there are different types of modulation (AM, FM, PCM), only one model may be flown on a single frequency at any one time.
- While you are getting ready to fly, if you place your transmitter on the ground, be sure that the wind won't tip it over. If it is knocked over, the throttle stick may be accidentally moved, causing the engine to speed up. Also, damage to your transmitter may occur.
- Before taxiing, be sure to extend the transmitter antenna to its full length. A collapsed antenna will reduce your flying range and cause a loss of control. It is a good idea to avoid pointing the transmitter antenna directly at the model, since the signal is weakest in that direction.
- Don't fly in the rain! Water or moisture may enter the transmitter through the antenna or stick openings and cause erratic operation or loss of control. If you must fly in wet weather during a contest, be sure to cover your transmitter with a plastic bag or waterproof barrier. Never fly if lightning is expected.

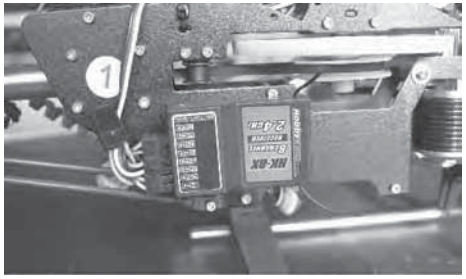
Part 1 HK-7X 2.4GHz Remote Controller System

HK-7X 2.4GHz REMOTE CONTROLLER SYSTEM UNITS ADVANCED ELECTRONICDEVICE, AND FEATURES WIDE USE. It can support multi-users and multi-equipmensimultaneously, and features quick response, high precision, and strong capability for antijamming.
HK-7X 2.4GHz R/C system supports one transmitter and several receivers, and makes ipossible that single radio can control several models simultaneously.
HK-7X 2.4GHz R/C system supports different brand gyro.
HK-7X 2.4GHz R/C system reacts quickly and precisely.

1.Mounting of Receiver

Installation position shall follow these conditions:
1.Keep the receiver away from engine, motor, ESC, battery, and other metal parts.
2.The antenna can not be covered by metal, carbon material or the other electronic conduction material.

Keep the antenna in 90 degrees with installed frame or bottom plate, it means that try to keep the antenna visible, see the graph below:



2.Connect Devices to Receiver

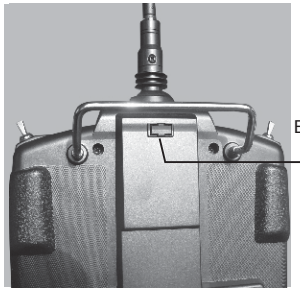
Connecting all devices and parts to the corresponding channels. Take notice of 3P signal wire must be connected in right way, or it will cause the severe damage to certain device or fail to work. There are some corresponding symbols of 3P on one side of the receiver:
(-) means cathode of power connected to the earth, usually links to the black line or brown line of 3P signal wire
(+) means the anode of power, usually links to the red wire of 3P singal wires.
(s) means signal wire, usually links to the white or yellow wire of 3P singal wires.Notice:please assess the power demand of the receiver of model when selecting the electricity supply style, ensure the receiver can get enough power supply when using, the voltage of the receiver not less than 4.2V at any time.

3.Binding Transmitter and Receiver

Before using the 2.4GHz remote controller system, you must bind the transmitter and the receiver. Binding them as following steps:
1) Power on receiver by plugging the ESC line, then plug the 'BIND line' into the 'BIND' slot of receiver. Then the LED of receiver will flash three times per second. Then you can remove the "BIND" line'.

2) Hold the 'BIND button' of transmitter, then turn it (keep holding), the RF LED of transmitter will flash fast.
3) After about half second, binding will finish, the LED of receiver will shine twice slowly, then enter working mode.
4) Release the 'BIND button' of transmitter, the RF LED will keep light, which indicates it is in working mode.on

The receiver has been plugged bind line



Bind button on the back of transmitter

Notice:

1)HK-7X 2.4GHz remote controller system sustain multiple receivers operation and long-distance scaning, so please make sure there's only your radio scaning. If there is any person who also use HK-7X 2.4GHz remote controller system at local, please operate only after other users pare the signal.

HK-7X supports seven models saving in one transmitter, they are numbering as n1 to n7. The binding will save the serial number in receiver. So if you bind one receiver with n1, it can only work when the transmitter is switched to n1.

4.Control Distance

All remote equipment has an effective range. It's not the same on the ground, and on the water surface or in the sky; It's not the same on flat ground and complex land; It's not the same in rainy days and in sunny days; And besides, the external electrical environment is changing continuously. It's quite necessary for the users who want to control at a long distance to test effective distance beforehand.Radio wave transfers almost in a straight line, please make sure there is no object between antenna and the controlled model. And the antenna should point at receiver's antenna, and keep the controlled model in certain distance where the model can be seen.controller system

Part2 Transmitter Manual

1 Features

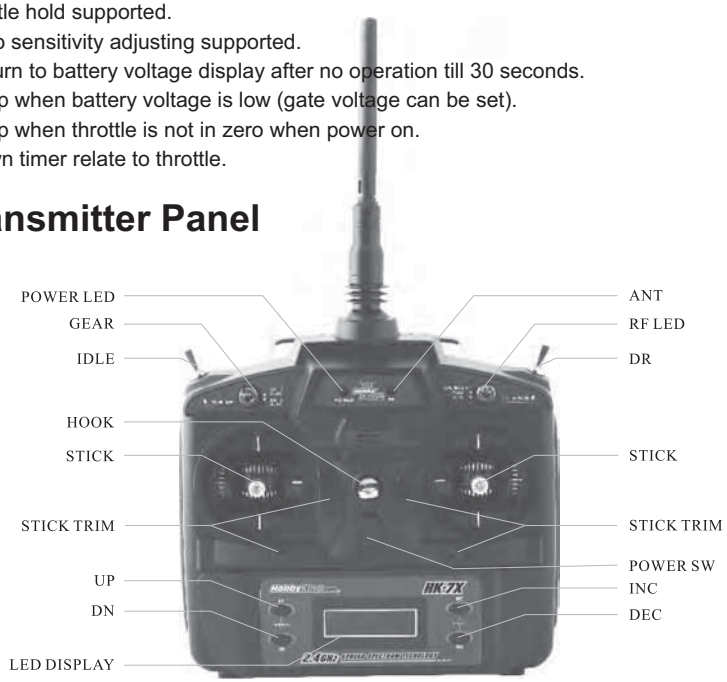
1 . LED display which shows model type and battery voltage on normal status.
2 . 7 models parameters store supported.
3 . Support 5 points throttle(THR) curve in NORMAL mode and IDLE mode.
4 . Support 5 points pitch(PIT) curve in NORMAL mode, IDLE mode and HOLD mode.
5 . Support HELI(helicopter) mode and AERO mode. Following modes are supported in each mode:

HELI mode	✓ **HP1**: Normal helicopter with 1 servo ✓ **HP2**: Swash helicopter with 2 servos ✓ **HP3**: CCPM 120° swash helicopter with 3 servos
AERO mode	✓ **AP**: Normal aero plane ✓ **VP** : V-tail plane ✓ **DP**: Delta wing plane

TABLE1 - Model type list

6. 7 channels standard servo signal output.
7. Set reverse (REV), sub trim (SUB) and travel by LED and button.
8. Dual rate (DR) control supported.
9. Throttle hold supported.
10. Gyro sensitivity adjusting supported.
11. Return to battery voltage display after no operation till 30 seconds.
12. Beep when battery voltage is low (gate voltage can be set).
13. Beep when throttle is not in zero when power on.
14. Down timer relate to throttle.

2 Transmitter Panel



2 Transmitter Panel

Switch & Button	Description	Detail
IDLE	In HELI mode, it is used to switch NORMAL mode and IDLE mode. In AERO mode, it controls channel6.	See Section-6.6 Section-6.7 Section-6.8 Section-7
DR	it is used to control dual rate of aileron, elevator and rudder.	See section-6.4
HOLD	THR hold switch.	See section-6.5
GEAR	In AERO mode, it controls channel . In HELI mode, it controls channel7.	See section-7 See section- .10
UP	Page up button	
DN	Page down button	
INC	Increase button	
DEC	Decrease button	

TABLE2 - Button list

3 Batteries C arging

If you are using NiCd or NiH batteries, you can charge it with a external power without getting batteries out.
You can find the power slot in the right side of transmitter, use a power with the plug shown as CHART20.

CHART20 - External Power

⚠ **Warning:**
The power should be 11.6V, the current should be at least 50mA. Other styles may be dangerous!

4. Stic d usting

To adjust the stick length, you should use a 1.5mm inner hexagonal screwdriver. Use the screw driver rotate anticlockwise one or two cycles to release the stick head, then you can rotate the stick head to adjust the length (see CHART21). Tighten the screw when finishing adusting.

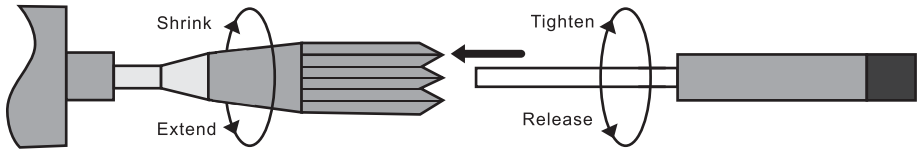


CHART21 - Stick Adjusting

System Setting

Hold UP and DN, and turn on transmitter, it will enter system setting mode like following:

CHART2 - System setting interface

There are three items "S1", "S2", "S3" and "S4".

- Press INC or DEC will change setting index from S1 to S4
- Press UP or DN will change setting content as TABLE3

Index	Content
S1. Model choice	Support seven models, see Section-10
S2. Model type choice	AP : Normal aero plane VP : V-tail plane DP : Delta wing plane Hp1: Normal helicopter with 1 servo HP2: Swash helicopter with 2 servos HP3: CCPM 120°swash helicopter with 3 servos
S3. Stick type choice	D1: Right hand mode D2: Left hand mode
S4. Low voltage gate	Set the voltage gate of low battery warning

TABLE3 - Details of system setting

6 Helicopter Mode

HP1, HP2 and HP3 are HELI mode, in this mode, the LED will display like CHART3:

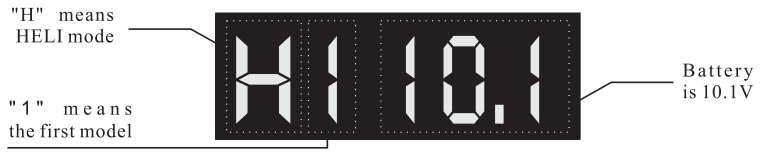


CHART3 - HELI mode

In HELI mode, the channel is:

Channel	Control	Detail
1	AIL	Aileron
2	ELE	Elevator
3	THR	Throttle
4	RUD	Rudder
5	GY	Gyro
6	PIT	Pitch
7	AUX	Auxiliary

TABLE3 - HELI Channels list

In HELI mode, there are 10 items which can be set, during configuration, you can press INC and DEC at the same time to exit setting and return to using mode.

6.1 Reverse Setting

Set normal or reverse for 6 channels, default is normal. To enter reverse setting, turn on transmitter, then press UP and DN at the same time, you will see "r1 xxx" like CHART4.

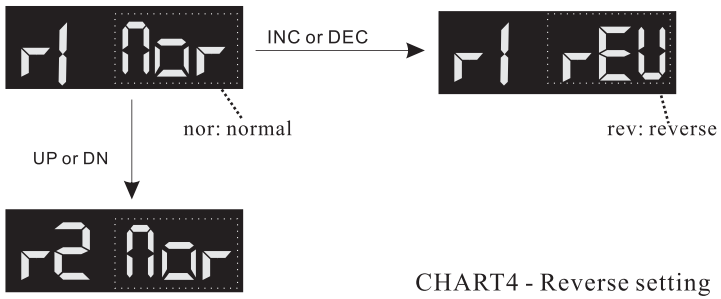


CHART4 - Reverse setting

Press UP or DN will change channel number, seems like "r2 xxx" "r3 xxx", etc. Press INC or DEC will change reverse status.

6.2 End Point Setting

Set travel(end point) from 0~120 for 6 channels, default is 100. To enter this setting, turn on transmitter, then press UP and DN at the same time twice, you will see "E1 xxx" like CHART5.

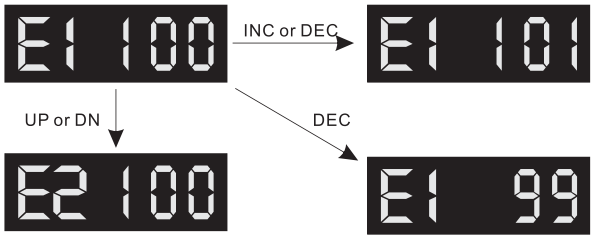


CHART5 - End point setting

Press UP or DN will change channel number, seems like "E2 xxx" "E3 xxx", etc. Press INC or DEC will increase or decrease the travel value.

6.3 Sub Trim Setting

Set sub trim from -100~100 for 6 channels, default is 0. To enter this setting, turn on transmitter, then press UP and DN at the same time three times, you will see "T1 xxx" like CHART6.

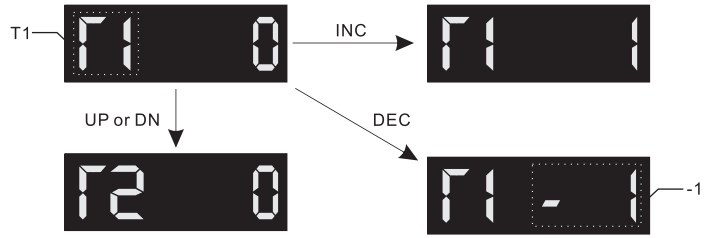


CHART6 - Sub trim setting

Press UP or DN will change channel number, seems like "T2 xxx" "T3 xxx", etc. Press INC or DEC will increase or decrease the sub trim value.

6.4 Dual Rate Setting

DR switch (see CHART1) controls the dual rate of aileron, elevator and rudder. And the rate of aileron, elevator and rudder can be set separately. There are two rates for DR SW=0 and DR SW=1, the two rates can be set from 0~120. Default value is 100 for DR SW=0, 70 for DR SW=1.

To enter this setting, turn on transmitter, then press UP and DN at the same time four times, you will see "dA0 xxx" like CHART7.

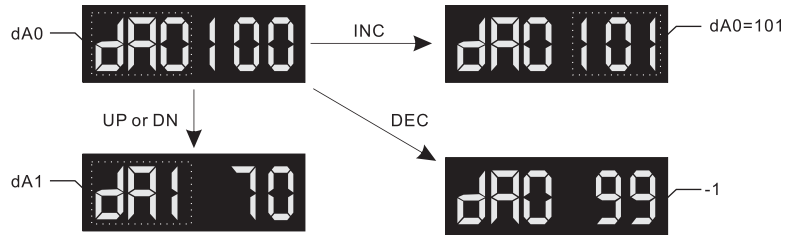


CHART7 - Dr for Ail setting.

.4 Dual Rate Setting

Press UP or DN will change the channel as TABLE4. Press INC or DEC will increase or decrease the rate value.

LED Display	Text	Meaning
dA0 100	dA0	Ail rate on DR SW=0
dA1 70	DA1	Ail rate on DR SW=1
dE0 100	De0	Ele rate on DR SW=0
dE1 70	De1	Ele rate on DR SW=1
dr0 100	Dr0	Rud rate on DR SW=0
dr1 70	Dr1	Rud rate on DR SW=1

TABLE4 - Dr setting turn

. T rottle Holding Setting

Throttle holding will lock the throttle at setting value, in lock status, the throttle signal will not be changed even if the throttle stick is changed. It is controlled by HOLD switch (see CHART1). When HOLD switch to 1, the throttle signal is locked (holding status), when HOLD switch to 0, the throttle signal is normal (change by throttle stick).
The holding value is from -20~+20, default is 0.
To enter this setting, turn on transmitter, then press UP and DN at the same time five times, you will see "H1 xxx" like CHART8.
Press INC or DEC will increase or decrease the holding value.

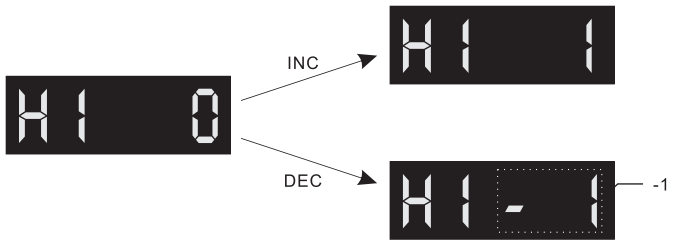


CHART8 - Throttle holding setting

. Gyro Sensitivity d usting

To enter this setting, turn on transmitter, then press UP and DN at the same time six times, you will see "G1 xxx" like CHART9.

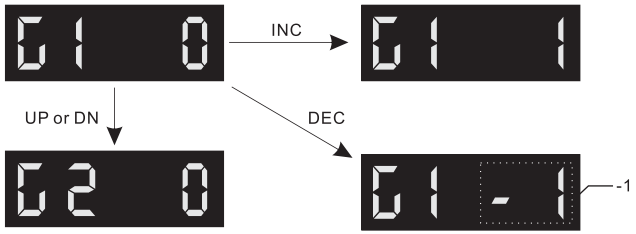


CHART9 - Gyro sensitivity setting

There are two sensitivites for gyro -- G1 and G2. The gyro signal is one of the two values ddecided by IDLE switch (see CHART1). When the IDLE switch in IDLE mode, the gyro signal is G2, when IDLE switch in NORMAL mode, the gyro signal is G1.
The sensitivity value can be set from -100 +100. When it is greater than , the gyro is in head-lock mode, when the value is lesser than or equal to , the gyro is in non lock mode. The default value is G G .

.7 T rottle Curve Setting

There are two throttle curves, one is for NORMAL mode, the other is for IDLE mode. Every curve has 5 points. Each point means the relation between signal and stick position as TABLE5.
To enter this setting, turn on transmitter, then press UP and DN at the same time seven times, you will see "CN1 xxx" like CHART10.

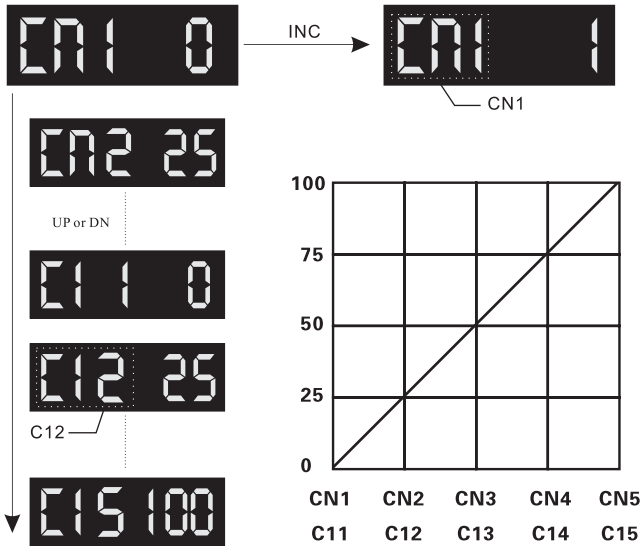


CHART10 - Throttle curve setting

.7 T rottle Curve Setting

Press UP or DN will change setting from CN1 to CN5 and CI1 to CI5. Press INC or DEC will increase or decrease the value of the point.
CN1~CN5 are the five points for NORMAL mode, CI1~CI5 are the five points for IDLE mode.

Point index	Stick position	Default signal value
1	Stick at lowest position	0
2	Stick at 25% position	25
3	Stick at center	50
4	Stick at 75% position	75
5	Stick at highest position	100

TABLE5 - Throttle curve stick value

. Pitc Curve Setting

There are three pitch curves, the first is for NORMAL mode, the second is for IDLE mode, the third is for HOLD mode. Each point means a stick position as TABLE5.
To enter this setting, turn on transmitter, then press UP and DN at the same time eight times, you will see "PN1 xxx" like CHART11.

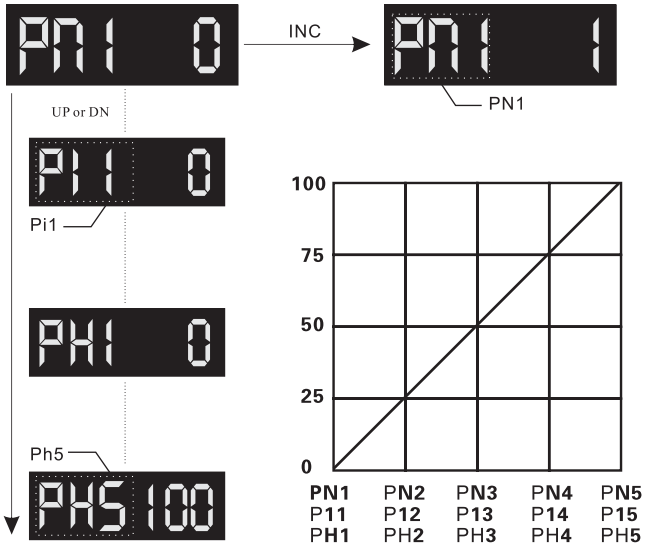


CHART11 - Pitch curve setting

Press UP or DN will change setting from PN1 to PN5, then PI1 to PI5, then PH1 to PH5.
Press INC or DEC will increase or decrease the value of the point.
PN1~PN5 are the five points for NORMAL mode, PI1~PI5 is the five points for IDLE mode, PH1~PH5 are the five points for HOLD mode,

Signal and Curve

The output signal of transmitter is related to "Curve" and "End point". For example, if the transmitter in HELI NORMAL mode, and THR curve of NORMAL mode is 0,30,75,80,100 (show as CHART12), and THR end point is 110. Then, if the THR stick is in 25% position, the curve value is 30, the output signal is 110*30%=33%.

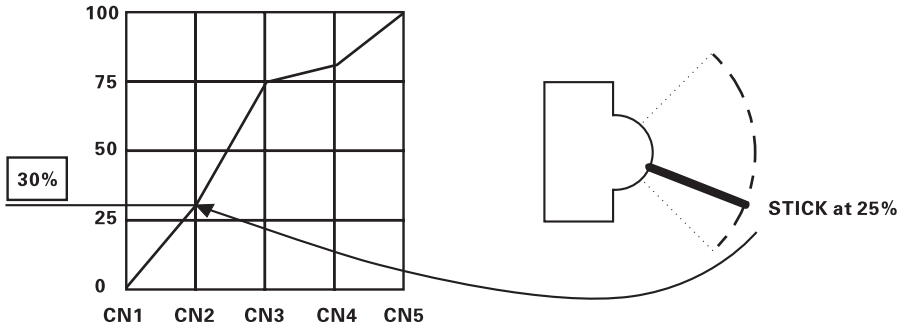


CHART12 - Signal and Curve

. S as Mi ture Setting

There are three items in swash mixture: AIL, ELE, PIT. All of three mixture percent values are from -100~+100, default values is 50.
To enter this setting, turn on transmitter, then press UP and DN the same time nine times, you will see "PA xxx" like CHART13.

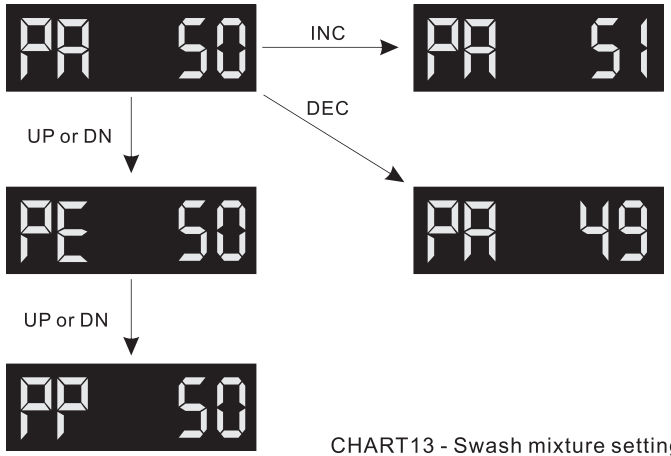


CHART13 - Swash mixture setting

Press UP or DN will change setting from PA to PE to PP, which means the "Mixture percent" of AIL, ELE and PIT.
Press INC or DEC will increase or decrease the value of the point.

.1 u c annel setting

When in HELI mode, the GEAR switch controls channel 7, and the AUX channel. There are two items in AUX channel setting, A1 and A2, control the signal of AUX channel when GEAR switch in different position.
To enter this setting, turn on transmitter, then press UP and DN at the same time ten times, you will see "A1 xxx like CHART 4.

CHART14 - AUX channel

Press UP or DN will change setting from A1 to A2.
Press INC or DEC will increase or decrease the value of the position.

7. ero Mode

AP is AERO mode. In AERO mode, the LED will display like CHART1 :

CHART15 - AERO mode

In AERO mode, the channel is:

Channel	Control	Detail
1	AIL	Aileron
2	ELE	Elevator
3	THR	Throttle
4	RUD	Rudder
5	GER	Gear, controlled by GEAR switch
6	FLA	Flap, controlled by IDLE switch

TABLE6 - AERO Channels list

There are six settings in V-tail mode. To enter setting, press UP and DN at the same time special times, and five operations beyond are the same as in HELI mode. See TABLE for details. You can press INC and DEC at the same time to exit setting and return to using mode.

UP&DN press times	Setting	Detail
1	Reverse	See section-6.1
2	End point	See section-6.2
3	Sub trim	See section-6.3
4	Dual rate	See section-6.4
5	Throttle holding	See section-6.5

TABLE7 - AERO Channels list

-tail Mode

VP is V-tail mode. In this mode, the LED will display like CHART1 :

CHART16 - V-tail mode

The channels and switches are the AERO mode, see TABLE6.
There are six settings in V-tail mode. To enter setting, press UP and DN at the same time for special times, and five operations beyond is same as in HELI mode. See TABLE for details. You can press INC and DEC at the same time to exit setting and return to using mode.

UP&DN press times	Setting	Detail
1	Reverse	See section-6.1
2	End point	See section-6.2
3	Sub trim	See section-6.3
4	Dual rate	See section-6.4
5	Throttle holding	See section-6.5
6	V-tail mixture	See section- .

TABLE - V-tail settings

.1 -Tail Mi ture Setting

There are four items in this setting: V1, V2, V3, V4. The value is from -100~+100, default value is V1=V3=V4=50, V2=-50.The output signal is decided by TABLE9.

Signal / Stick	Ch2	Ch4
ELE stick	V1	V2
RUD stick	V3	V4

TABLE9 - V-tail signal

Press UP or DN will change setting from V1 to V4. Press INC or DEC will increase or decrease the value. See CHART .

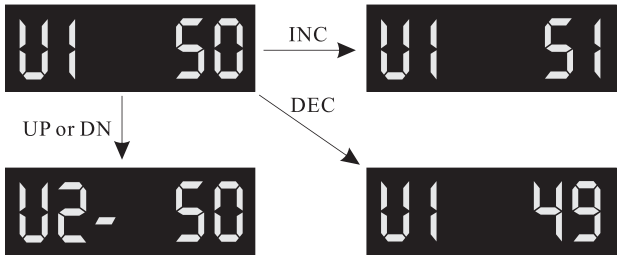


CHART1 - V-tail mi t e ettin

Delta ing Mode

DP is Delta wing mode. In this mode, the LED will display like CHART :

CHART1 - elta in mode

The channels and switches are the same as AERO mode, see TABLE .
There are six settings in Delta wing mode. To enter setting, press UP and DN at the same time special times, and five operations beyond are the same as in HELI mode. See TABLE10 for details. You can press INC and DEC simultaneously to exit setting and return to using mode.

UP&DN press times	1	Reverse	See section-6.1	2	End point	See section-6.2
Setting	3	Sub trim	See section-6.3	4	Dual rate	See section-6.4
Detail	5	Throttle holding	See section-6.5	6	Delta wing mixture	See section-9.1

TABLE10 - Delta wing settings

.1 Delta ing Mi ture Setting

There are four items in this setting: d1, d2, d3, d4. The value is between -100~100, default value is d1=d2=d3=100, d4=-100. The output signal is decided by TABLE11.

Signal / Stick	CH2	CH4
AIL stick	D1	D2
ELE stick	D3	D4

TABLE11 - Delta wing signal

Press UP or DN will change setting from V1 to V4. Press INC or DEC will increase or decrease the value. See CHART .

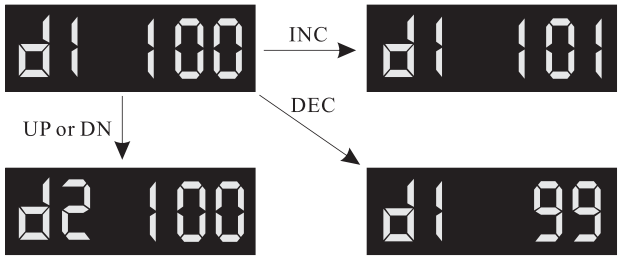


CHART1 - elta in mi t e ettin

1 Models S itc

HK-7X can support seven models, each model can has its own parameters. To switch among the five models, you should hold UP and DN , then turn on transmitter, then press INC till "S1 xx" is shown like CHART20.

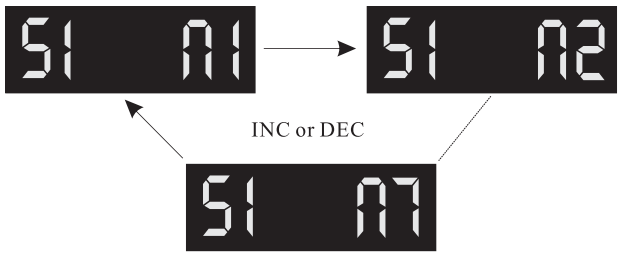


CHART - odel itch

Press INC or DEC will switch from n1 to n7 which indicates each seven model. When some model is selected, press UP and DN at the same time to return to normal using mode. Now the transmitter will load the parameters of your selection and all your settings will be saved into the model you selected.

11 Throttle warning

HK-7X 7CH supports throttle warning. If the throttle stick not is in the lowest position when power on, the transmitter will block in warning status. You will see "THro" in panel and hear continuously beep till you move the stick to the lowest position.

CHART21 - Throttle warning

12 Idle warning

HK-7X 7CH supports Idle warning. If the Idle switch on when power on, the transmitter will block in warning status. You will see “IdLE” in panel and hear continuously beep till you switch Idle to off.

CHART22 - Idle warning

13 Down timer

HK-7X 7CH has a down timer relate to throttle.When in normal using status, press DEC and DN at the same time to enter down timer. The default value is five minutes,like CHART22. You can press INC or DEC to change the value.When you push throttle stick up, the timer will run from the value you set to zero. After minutes remaining, the transmitter will beep to notify you.

CHART23 - Down timer

14 No Control Protection

HK-7X 7CH remote controller system supports ‘No Control Protection’ function. You can predefine a set of values for each channel. The receiver will use these values if it lose the signal from transmitter.To set the values, please do as following steps:

1. Turn on the transmitter and receiver, bind them.
2. Adjust the transmitter, make all channels to the position as you perfer.
3. Press ‘UP' and ‘INC’ at the same time, the screen of transmitter willdisplay ‘NCP’ like Chart 24, and the RF led shines, at the same time, the led of receiver will go out.
4. After 1 second, the transmitter and the receiver will restore to normal status, the define of ‘NCP' is done.

CHART24−NCP setting

15 Using PPM signal

HK-7X 7CH is a digital device, it also has a signal output slot on the bottom. But in common using, the output signal is PCM format. If you are using a flying simulator on your computer, the simulator software can not work with HK-7X PCM signal. So you must switch the signal to PPM by following steps:1.Set the model to the type you perfer, for simulator using, it should be set to AP normally.2.Turn off the transmitter, then Hold 'INC' and 'DEC' , and turn on it.3.You will see the screen shows 'PP XX.XV' like chart 25.4.The transmitter switches to PPM status now, and the signal from the slot is standard PPM format, you could connect it with simulator adapter.

CHART 25 − PPM status

Notice: when the transmitter in PPM status, the RF module stops working and RF led will off, then the receiver will lost signal if it was on.

16 Changing Transmit Frequency

Electric interference may exist when using remote controller system, if it interferes with the frequency of your remote controller system, your devices will be out of control. Under these circumstances, you can try to change the transmit frequency by following steps to keep away from it:

1. Turn off receiver, turn on transmitter.
2. Hold the bind button of transmitter until the RF led shines once a second.
3. Release the bind button, then press bind button again instantly, RF led will shine for 1 second.

Turn off the transmitter, frequency changing is completed.

Notice:

1. You must turn on the transmitter again after frequency changing.
2. The new frequency is selected randomly, if the interfere still exists, you can try to change it again until the interference disappear.
3. After the frequency changing, all the receiver bindings with this transmitter should be rebinded again.

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